AMENDMENTS TO THE SPECIFICATION

Please replace the paragraph beginning on line 2 of page 15 with the following amended paragraph:

The preferred embodiment concerns a method to produce a passive and/or active and/or responsive and/or internal and/or external optical touch screen with a flip over Keyboard including joystick and scroll functionality by employing various means which can be "tailor made" or found as integral parts of many electronic devices such as digital CCD, light source, software, ROM, processor, power supply, print, a screen and a light transparent element or screen cover (25) including special layers and mirrors and aperture and filters+various means for writing with a lighted or a reflective pointed tool both possible to combine with ordinary writing tools and means for presenting reflections from barcodes.

Please replace the paragraph beginning on line 15 of page 15 with the following amended paragraph:

A CCD is used as a light detector because it is cheap, energy economic+100% digital and thus possible to be ~~build~~built into ~~coming~~future single chip mobile phones. The digital image sensor is expected to follow Moore's law and double its performance concerning key parameters such as resolution, energy consumption, position update frequency sensitivity etc. every 18 ~~month~~months. This means that competing touch screen technologies with analogue components cannot keep pace with the quality development.

Please replace the paragraph beginning on line 23 of page 15 with the following amended paragraph:

In order to pick up the strongest possible signal with the best signal/noise ratio the software tunes the CCD to the exact same frequency as the signal emitting light source. Both the pen and the CCD tune ~~in to~~into the same ~~frequency~~ frequency, that ~~is~~is, out of synchronicity with the local electric grid net.

Please replace the paragraph beginning on line 29 of page 15 with the following amended paragraph:

The CCD measures the ambient light and ~~set~~sets the screen luminance to an adequate level. This feature saves energy by optimising the power for screen luminance to a minimum.

Please replace the paragraph beginning on line 19 on page 16 with the following amended paragraph:

The screen cover (25) consists of a stiff transparent layer of for instance PET and a soft, scratch resistive upper layer of for instance silicone. Such a screen cover (25) has excellent transparency compared with screen cover (25)s with resistive touch screen functionality. The ~~inheritproperties~~inherent properties, such as high brilliance, high luminance, good side visibility and low ~~distortion~~distortion, leads to considerably lower power consumption, less required battery capacity ~~need~~ and less voluminous design requirements.

Please replace the paragraph beginning on line 1 on page 17 with the following amended paragraph:

Mirrors are coated with a selectively IR mirroring ~~layer~~layer, and lenses (27, 28, 29) to see out of the internal screen ~~is~~are coloured so only the desired IR wavelengths ~~pass~~passes through.

Please replace the paragraph beginning on line 8 of page 17 with the following amended paragraph:

Under the two secondary concave mirrors ~~(13)~~(13), that project the light to the ~~CCD~~CCD, the screen cover (25) is not coated with an IR mirroring layer.

Please replace the paragraph beginning on line 11 of page 17 with the following amended paragraph:

The screen cover (25) can be produced in a single mould with a double moulding process where the first hard plastic with all the optics is produced in the first process and the softer upper layer is produced in the last process. The screen cover (25) edges have angles that let light pass out and is coated with an absorbing layer except where there is placed concave mirrors (30,31,32)--see FIG. 14--and lenses (27,28,29), which transmit light in the optic system.

Please replace the paragraph beginning on line 26 of page 17 with the following amended paragraph:

The apertures are slightly tilted so the light passing through them will be received by different rows of the CCD slightly dislocated. This dislocation creates a better signal for triangulation. Each row is analysed separately because the pattern is slightly different from the pattern of the row beneath and the row above. During the analysis the software will find the extension of the light intensity distribution on the CCD by finding the first dark pixel on each side and also by finding the pixel with peak intensity. ~~Then~~Then, the software will compare all the rows to find the row with the highest peak intensity and to find the exact extension of the light intensity distribution by finding the darkest pixels close to the light intensity distribution. This enables the software to create a precise image of the light intensity distribution including peak and extension. This is done for every light extension distribution behind every aperture in every row exposed to incoming light from the transmissive element and upper layer (25, 26). A large/medium/small extension of the light intensity distribution correspond to a large/medium/small contact area and or the indent made by a stylus with an internal light emitter or a stylus with no internal light emitter depressing of the soft upper layer (26). A highest peak correspond to the centre of a contact area.

Please replace the paragraph beginning on line 19 of page 18 with the following amended paragraph:

In the edge of the screen cover (25)--see FIGS. 1-3--opposite the CCD, light moving in near straight angle is ~~send~~sent into the upper ~~soft screen cover~~layer (26) layer via a lens. A slight difference in the refractive index creates a small Brewster angle between the two layers. Any depression of the upper soft layer by any object such as a finger, a pen etc. will create an indent that mirror light beams down wards and all light beams that do not exceed the Brewster angle between the screen cover and upper layer (25, 26) and air will stay trapped in the screen cover and upper layer (25, 26) and thus be transmitted to the CCD enabling the software to do triangulation. The light has an alternative colour corresponding with selective filters that allow this colour exclusively to pass apertures for this particular function.

Please replace the paragraph beginning on line 31 of page 18 with the following amended paragraph:

Two wide-angle lenses (27,28)--see FIG. 14--are placed in the edge of the internal screen cover (25) and two concave mirrors (30,31) are placed in the opposite side to project incoming light from the wide-angle lenses. The concave mirror (31) furthest from the CCD project the light from the furthest wide angle lens (28) via a special primary concave mirror (60), below or above the ordinary primary concave mirror (10) and then to the secondary (13) and through the thin film with aperture (19) to the CCD. The special primary concave mirror (60) is coated to reflect only light in wavelengths coming from external signal providers and the rows of the CCD, which detect the light from external signal providers are have filters, that only accept light with wavelength similar to the external signal providers. The concave mirror (30) closest ~~(30)~~ to the CCD project the light from the nearest wide-angle lens (27) directly to the closest secondary concave mirror (10) and through the thin film with apertures (19) to the CCD. The optics for the canals is adjusted to cover a desired external angle of for instance 90 degrees establishing an external touch screen, that can be employed close range for hand writing (52) or at a white board size touch screen (51)--see FIG. 16.

Please replace the paragraph beginning on line 26 of page 19 with the following amended paragraph:

3D information can be added to the triangulation process by placing a third wide-angle lens at a place where the screen cover (25) is bending 90 degrees--see FIG. 14. The incoming light from the 3D wide-angle lens (32) is transmitted to the CCD in the same way as the furthest concave mirror (31) acting as a 2D wide-angle lens ~~(31)~~.

Please replace the paragraph beginning on line 6 of page 20 with the following amended paragraph:

An icon can for instance be a portrait that appears when a contact in the phone book is ~~high lighted~~highlighted. This "contact" icon (36)--see FIG. 6--is a circle where usual contact related information is placed clockwise and command likewise so a simple dot with the pen can call, SMS, MMS, mail, fax etc. a person. Icons can have outer rings with more command structures.

Please replace the paragraph beginning on line 14 of page 20 with the following amended paragraph:

A ~~Keyboard~~keyboard (35)--see FIGS. 4-8--can be moulded in a soft, tough, responsive and transparent material such as silicone or polyurethane. The Keyboard is mounted with suction pads upon the touch screen. IR light is ~~send~~sent into the keyboard directly through the screen cover (25) into one of the suction pads ~~(43)~~. The keyboard is moulded with light diffusing particles. A partial covering IR mirror layer (41) optically ~~disconnect~~disconnects the keyboard optically from the screen cover (25). Each button is slightly above the screen cover (25) and has a point (40) that can be connected optically to the screen cover (25) by pressing it down. The incoming light will be detected and triangulated. Placing contact points (40) around for instance a rounded shape makes joystick and scroll functions. When the user ~~press~~presses or ~~pull~~pulls a contact point (40) comes into contact and ~~send~~sends a signal. The ~~buttons~~button's optical contact point is made in a 3D design that ensures that increased pressure will enlarge the contact area or shape it in a particular form. This is detected and analysed as a responsive signal that can be associated with distinctive commands depending of the shape. The design allows for customisation of users products by choosing flip over Keyboard and screen created graphics beneath the buttons as accessories. The Keyboard design allows for tactile features that can help persons with poor eyesight as well as anybody else to use their electronic products better. Icons according to the producers or the individual user wishes can be mounted beneath the Keyboard in areas where there is no active screen beneath the touch screen.

Please replace the paragraph beginning on line 8 of page 21 with the following amended paragraph:

The pen (1) for active input to internal touch screen is made with an internal light source and the pen point is chemically coated to bind one molecule thick layer of water in order to increase the optical contact and to ensure pleasant super low friction use. The pen point is completely rounded to ensure the same contact area no matter which angle the users choose to tilt his or ~~hers~~her pen. A pen touching the soft upper layer (26) of the internal touch screen will create a small indent (15) that acts like a wide-angle lens and increase the entrapment of incoming light in the screen cover and upper layer (25, 26).

Please replace the paragraph beginning on line 30 of page 21 with the following amended paragraph:

[0158] A pen point to scan barcodes (5)--see FIG. 15--~~consist~~consists of a co-axial pipe divided in a central light emitting pipe (8), that via a light conduction is connected to an IR light source, a light shielding pipe (7), a light conducting pipe with light diffusing properties (9) and a light shielding pipe (7) with a stripped light ring (18) that permit the light diffusing pipe to be seen by the wide-angle lenses (27,28). The barcode reader ~~rest~~rests on its outer pipe while the user scans the pen upright over a barcode. The light coloured intersections of the barcode reflect light beams into the diffusing pipe and the ring of light is detected via the wide-angle lenses. The shadow/light signal is correlated with the triangulated position enabling the software to read the barcode properly because both speed and dark light reflections can be analysed. The user points out the corners of the barcode before scanning them in order to enhance the bar code reading accuracy. This enables the software to determine the direction and speed of the bar code reader pen relative to the barcode.

Please replace the paragraph beginning on line 12 of page 22 with the following amended paragraph:

Each spot of an object with unique bar code identification is assigned to contain information. Upon reading a unique bar code identification within an external touch screen the user will be prompted to answer whether or not to access a homepage corresponding to the bar code. Upon user acceptance to access the ~~homepage~~homepage, the bar code assigned information is retrieved to the device and the following procedures are carried out. (can be done online as well.) The user marks the corners of the object with unique bar code identification by pointing a pen within an external touch screen. Now the device contains information assigned to any particular position and the relative position of any particular position. The user can now point out any position to access information or commands assigned to this particular position. As an example, a picture of a woman in a car driving past a hotel can contain information about the car, the ~~woman~~woman's dress, the hotel and how to purchase either of them. Any object such as goods, papers and magazines etc. can contain unlimited information that can be retrieved from the Internet in this way. User manuals, origins, advanced details concerning logistics, cooling chain information, health warnings, legal notice, test schemes, list of content, price, warranty etc. can be part of the information. The user can beforehand access their own personal homepage and enter any settings they want retrieved information to be matched

to. The settings could for instance involve personal preferences of purchase including for instance body measurements, allergic risk assessment, diets, financial status, shopping lists, gift list, information needs in respect to different interest and so on. All information on goods and information of choice can be stored in a virtual shopping cart and retrieved when it is convenient for the user to make decisions of purchase. A part of the personal settings can involve software agent that automatically search the Internet for cheaper similar product offers. The user can in this way systemise purchase and information gathering in order to gain savings and increased quality.

Please replace the paragraph beginning on line 13 of page 23 with the following amended paragraph:

A factory calibration is done once and for all by applying gradually harder pressure to a point in contact with all points of an O-pen touch screen. The pressure will increase the size of the area in optical contact with the touch screen and/or alter the contact areas shape. The software will then store information about the shape depending on applied pressure and become able to identify the pressure. This enables the software to represent all active signal providers in a responsive manner. The software can furthermore have ~~built in~~built-in simulations of particular writing tools such as various brushes pens etc.

Please replace the paragraph beginning on line 22 of page 23 with the following amended paragraph:

High quality measurement of handwriting including the particular pen point speed variations and the pressure variations plus the unique amplitude pattern (37) identification of signal providers enhance the credibility of a digital signature performed by the user every time an action needs a signed confirmation. The digital signature security is greatly ~~increased~~increased, because the device with O-pen touch screen, the signal provider, the address, the person and the signature plus possible a picture taken by the ~~built in~~built-in camera all can be confirmed. Devices with O-pen technology will be able to function as extra secure credit cards both in normal purchase situations and when the user purchase goods and information over the net.

Please replace the paragraph beginning on line 14 of page 24 with the following amended paragraph:

Instead of a soft all in one piece ~~keyboard~~ keyboard, a keyboard can be moulded of hard plastic parts with small contact areas suited to create small indents in an upper soft layer (26) that will cause light beams to be reflected up and down to the CCD through the ~~lower hard part~~lower transmissive element and the upper soft ~~part of a transmissive~~ layer (25, 26). The keyboard has a rigid supportive structure that spreads out pressure over a larger area of the upper ~~part of the transmissive~~ layer (26) in order to prevent incidental indents and consequently noise creation in the form of up and down reflecting light beams to occur. The individual keys are supported by the supportive structure and only the individual keys contact area can be pressed through holes in the supportive structure into the upper soft layer (26) of the transmissive layer. Scroll and joystick keys are fitted to the supportive structure with elastic glue such as silicone. When the user ~~press~~presses the outer perimeter of a scroll ~~button~~buttons, one or more contact areas create detectable indents in the upper soft ~~part~~layer (26) of the transmissive layer. The contact areas can be formed so that an increased pressure will enlarge the ~~indent~~indent, enabling the touch pad and software to detect a responsive signal. Adding a central stick to a scroll ~~button~~button, that can be pulled instead of ~~pressed~~pressed, makes a joystick.

Please replace the paragraph beginning on line 5 of page 25 with the following amended paragraph:

The entire ~~optic~~optical system can be produced in a holographic production process. This will decrease production variations and thus increase accuracy. In very complex variations it will also become an economic advantage.

Please replace the paragraph beginning on line 11 of page 25 with the following amended paragraph:

Alternative to a hard pen with a rounded ~~point~~point, a soft pen point can be employed to increase the contact area. This is beneficial especially in connection with hard surfaces. A pen with a feather load relief of excessive pressure can reduce stress on the surface and pen point.

Please replace the paragraph beginning on line 25 of page 25 with the following amended paragraph:

~~Alternatively~~Alternatively, the pen can emit light in the form of heat that is charged to the pen through for instance microwave or friction or induction or a ~~built-in~~ built-in radioactive heating.

Please replace the paragraph beginning on line 29 of page 25 with the following amended paragraph:

The ~~Flip~~flip over ~~Keyboard~~keyboard (35) can be mounted by push buttons or slide into holders or be produced as a strap on ~~solution~~solution, ~~or~~ glued ~~on~~on, ~~or~~ welded ~~on~~, or screwed on.

Please replace the paragraph beginning on line 8 of page 26 with the following amended paragraph:

One wide-angle lens can be placed in front of one or more apertures. Through this ~~lens~~lens, light directly from the pen point and light reflected from internal screen edges with colour selective mirrors that divide the light from the pen into two separate colours is projected to the image sensor. This will project at least three clearly defined dots on the image sensor enabling the software to do an accurate triangulation.

Please replace the paragraph beginning on line 19 of page 26 with the following amended paragraph:

Instead of secondary ~~mirrors~~mirrors, an optical taper (57) placed after the apertures (19) can concentrate the light on a small part of the image sensor.

Please replace the paragraph on line 28 of page 26 with the following amended paragraph:

Partial monochrome image sensor can enhance the ~~resolution~~resolution, because there are four times as many pixels as compared with colour image sensors.

Please replace the paragraph beginning on line 31 of page 26 with the following amended paragraph:

Instead of multiple apertures or in combination with multiple ~~apertures~~apertures, the image sensor can have rows of pixels that are slightly dislocated (39). The dislocation could be for instance

{fraction (1/10)} of a pixel width. This will create a slight differentiation between each row and thus increase resolution.

Please replace the paragraph on line 9 of page 27with the following amended paragraph:

The ~~built in~~built-in camera or a connected camera or a wireless camera can be used photograph an unique code consisting of a micro pattern, which can be invisible to the human eye. The invisibility can be achieved by printing the pattern with ink that is only visible outside the visible light wavelength spectre for humans or by incorporating the pattern into raster. Invisibility enhance the visual design opportunities and the code can still be detectable either by scanning for it with the camera or by establishing a standard right upper corner position for instance.